Enabling Alzheimer's disease diagnosis with a blood sample

The company's proprietary concept is built upon the scientific premise that a disease evokes systemic responses in monocytes unique to that disease – which can be accurately measured in a blood sample. The concept is patented in Europe and in the USA. Exclusive global rights for several diseases including Alzheimer (AD), Parkinson and MS are secured through an exclusive license agreement with the patent owner Inven2.

The Need: Alzheimer's Disease (AD) is a **global pandemic,** representing a €300 bn yearly expenditure in EU and affecting ~10% of its population above 65 years old. However, it has been estimated that a **five-year delay in the disease onset could reduce the disease prevalence** – and its costs – by up to 33% over the next decades, representing potential savings over €100 bn in EU alone.

The **disease progression** could be delayed by combining compounds to block the initial stages of the neurodegenerative cascade and by lifestyle adjustments; **however,** current drug pipeline does not trigger sizeable improvements in AD patients. This is primarily due to **irreversible brain damage in later AD stages. Over 2,000 various AD interventions** have been or are being tested in the World according to clinicaltrials.gov**, around 600 of those in Europe**, to compete in a **growing, €2Bn market**. But how **to test** the if those interventions **are working** in a quick, reliable and cost-efficient way? How to **effectively select** the patient cohorts for the tests?

Therefore, the need for **early diagnosis** before symptoms arises become apparent, both to delay AD progression and to **test the large pipeline of potential breakthrough medications**. Despite the high need for early diagnosis, only 36 trials for **AD detection** are registered at clinicaltrials.gov. Will any of these work? Are they cost-effective?

In July 2018 Biogen and Eisai announced positive topline results of the final analysis for their drug candidate BAN2401 at 18 months, with new data providing compelling evidence to further support amyloid hypothesis as a therapeutic target for Alzheimer's disease. The recent progress within drug development triggers an increased demand for better diagnostic tools.

Currently, the detection options are cerebral fluid test (detects beta-amyloid (Aβ**)** - a neurotoxic metabolite that is the initiator of AD's neurodegenerative cascade, as well as Tau and pTau biomarkers; it is **invasive and costs around €5,000)** and PET imaging (detects Aβ plaques, relies on **radioactive isotope injection and costs around €3,000**). Both tests show amyloid burden which is not well correlated with the clinical symptoms. These are not suitable for mass screening and are therefore used when AD has progressed.

Our solution: The world's first in-vitro diagnostic (IVD) blood test for accurate AD diagnosis –**PreADx** (currently at TRL6) **provides a direct indication of a dysfunctional immune system** leading to AD's pathological process quickly. PreADx detects reduced clearance of Aβ, through the combination of efficient isolation of blood monocytes and proprietary sheep monoclonal antibodies combined with human recombinant anti-complex antibodies to quantify Aβ degradation through an accurate immunoassay test. **This indication is available years** before **clinical** symptoms onset, **allowing for the first time to understand the disease dynamics with time** and allow timely prescription of AD medications as well as follow up AD's progression.

Expected impact:

- Key technological enabler for the pharma industry, enabling to monitor the disease dynamics with time, test the effects of an early drug prescription in AD progression and assist the selection of patients in clinical trials - **representing a €750K savings potential for an average-sized clinical trial, which can surpass €6Mn for large phase III trials**;
- Clinical cornerstone to monitor patients at risk of developing AD, allowing early interventions, and **reduce the probability of disease aggravation** and onset of cognitive impairment;
- Widely used test for early AD identification, exploring the **existing customer demand for accurate early AD diagnosis.**

The Business case: By bridging the critical funding gap until having the first commercial product, the VERDAD project will untap strong market traction from the current interest from pharma players in cost-effective AD diagnostic solutions. The preferred **exploitation model is licensing** and to this end, letters of support (LOS) and expression of commercial interest have been secured from **5 global companies, Roche Diagnostics, Pfizer, BASF Pronova, AbbVie and MSD** (see LOS' in Section 4). In addition, it will serve as a cornerstone to untap additional private investment in our company needed to bridge this funding gap.

The Team: PreDiagnostics' team of seasoned entrepreneurs is perfectly aligned to champion VERDAD, by taking advantage of extensive business development experience within the biotech arena.

Contact details: **Håkon Sæterøy, CEO,** Phone +47 926 95 175, e-mail: Haakon@pre-diagnostics.com
Erik Christensen MD PhD, CMO/COO, Phone +47 959 39 918, e-mail: Erik@pre-diagnostics.com